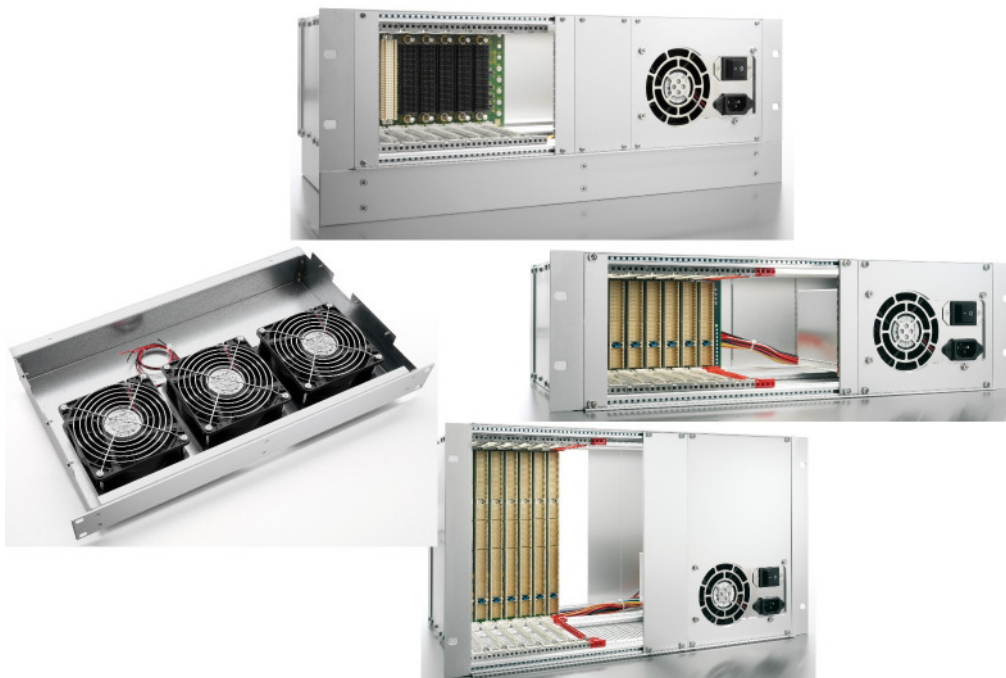


User's Manual

CPCI Basic 3U and 6U, 84HP

VPX Basic 4U, 84HP

Fan Tray 1U, 84HP



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Hartmann Elektronik is a longstanding partner of the
embedded industry and has a variety of different backplanes.
With our wide selection of backplanes and enclosure you can
build your perfect system platform

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1 Applicability

System name	Order number
CPCI Basic 3 U 84 HP Depth 280 mm	LMH0000100
CPCI Basic 6 U 84 HP Depth 280 mm	LMH0000090
VPX Basic 4 U 84 HP Depth 280 mm	LMH0000410
Fan Tray Basic 1 U 84 HP Depth 280 mm	C161.60410
Fan Tray Basic 1 U 84 HP Depth 280 mm with System Monitoring	LMH0000230

1.1 Background Information

- User Manual Hartmann cPCI Backplanes
- Technical Data Hartmann CPCI Backplanes
- User Guide Hartmann CPCI Backplanes
- User Guide Fan control HE2661 HW and HE2661 SW
- IEC 60297-3-101, -102, -103
- PICMG 2.0 R3.0 CPCI Core Specification
- PICMG 2.01 R2.0 Hot Swap
- PICMG 2.09 R1.0 System Management Bus
- PICMG 2.10 R1.0 Keying
- VITA 46.0 baseline specification, VITA 46.1 VME, VITA 46.4 PCI Express
- IEC 1000-4-4 Electromagnetic Compatibility, Part 4, Section 4, Electrical fast transient/burst immunity test.
- EN60950-1
- Shock:
 - MIL-STD-810F 1 January 2000 Annex C, U.S highway truck Figure 514.5C-1, vertical Shock test (Sawtooth) Figure 516.5-10
- Vibration:
 - DIN EN 61373:1999, Figure 2, Category 1, Class B
 - MIL-STD-810F 1 January 2000 Annex C, Shipboard: Figure 514.5C-15

2 Safety

2.1 Intended Application




The CPCI System Platform Basic subracks is intended as a platform for a microcomputer system based on the CPCI Standard PICMG 2.0 R3.0.

CPCI System Platform Basic subracks are not end-products, so there is no valid approval for this unit. In Order to enable stand-alone functionality, additional elements are required. An operational system is achieved only by way of appropriate CPCI boards.


The completion and final testing of the units have been carried out, or at least supervised, by qualified technicians. These instructions are directed exclusively to these qualified technicians i.e. engineers, trained and qualified electricians etc.

Make sure that the finished system complies with the safety regulations currently applicable in the country it is going to be used.

2.2 Safety Symbols

	<p>Hazardous voltage!</p> <p><i>Familiarise yourself with the danger of electrical voltages and the safety precautions before starting to work with parts that carry dangerous voltages</i></p>
	<p>Caution!</p> <p><i>This symbol indicates a condition where damage of the equipment or injury of the service personnel could occur. To reduce the risk of damage or injury, follow all steps or procedures as instructed.</i></p>
	<p>Danger of electrostatic discharge!</p> <p><i>Static electricity can damage sensitive components in a system. To avoid damage, wear ESD wrist straps or at regular intervals touch blank enclosure parts.</i></p>

2.3 General Safety Precautions

	<p>Warning!</p> <p><i>Voltages over 60 VDC can be present in this equipment. This equipment is intended to be accessed, to be installed and maintained by qualified and trained service personnel only.</i></p> <p><i>This equipment is designed in accordance with protection class 1!</i></p> <p><i>It must therefore be operated only with protective GND/earth connection!</i></p>
---	---

2.4 Safety Instructions

The intended audience of this User's Manual is system Integrators and hardware/software engineers.

The product has been designed to meet relevant standard industrial safety requirements. It must not be used except in its specific area of office telecommunication industry and industrial control. It shall not be used in safety-critical applications, life-sustaining appliances or in aircraft.

Only trained personnel or persons qualified in electronics or electrical engineering are authorized to install, operate or maintain the product.

This section provides safety information about:

- Protection Against Electromagnetic Interference (EMI)
- Electrostatic Discharge Precautions
- System Installation

2.4.1 Protection Against Electromagnetic Interference (EMI)



The product has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules, EN 55022 Class A.

To ensure proper EMC shielding, operate the subrack only with all free slots populated with filler panels.

Ensure that all EMI gaskets make correct contact.

2.4.2 Electrostatic Discharge Precautions



Electronic components can easily be destroyed by electrostatic discharge which can occur between subrack components and a person.

- Before working on the rack make sure that you are working in an ESD-safe environment.

2.4.3 Installation

To avoid subrack damage verify that the system environment meets the environmental and power requirements given in this guide before installation consider these guidelines:

2.4.4 Location

Locate the system in a stable area free of excessive movement and jarring, dust, smoke, and electrostatic discharge (ESD). Make sure that the temperature does not exceed the operating temperature given in the environmental requirements in this guide and allow room for proper air flow for cooling.

2.4.5 Voltage Hazards



The system is powered with a power supply the mains voltage is 115/230VAC. (Voltage range 85VAC to 265VAC)

This voltage is considered hazardous.

2.4.6 System Overheating

The boards are cooled by heat dissipation through convection (from bottom to top).

Ensure that other equipment below or on top of the subrack do not obstruct the airflow through the systems.

The subrack ambient temperature may not exceed 40 °C.

2.4.7 Mounting Considerations

During the course of handling, shipping, and assembly, parts could become loose or damaged.

Do not operate a shelf in this condition, as this may cause damage to other equipment.

2.4.8 Electrical Hazards

The caution label on the system's rear near the grounding studs shows that you have to create an earth connection because there may be a high leakage current which is considered hazardous.



High leakage current can cause injuries.

Ensure that the system is properly grounded at all times, the following conditions shall be met:

- This equipment shall be connected directly to the AC supply system earthing

2.4.9 Board Installation

Electrostatic discharge and incorrect board installation or removal can damage circuits or shorten their life.

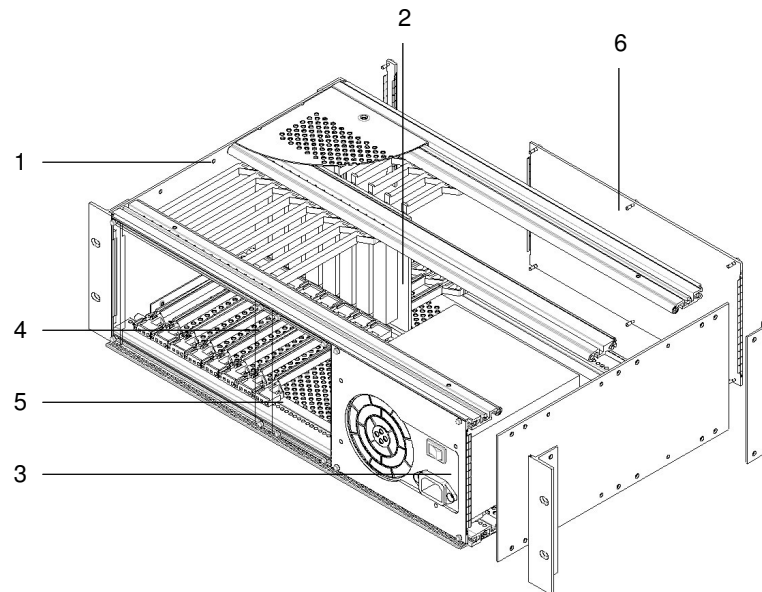


- Before touching the boards, rear transition module or electronic components, make sure that you are working in an ESD-safe environment
- Boards should be inserted and removed using their handles, do not force the board by applying pressure to the front panel.

3 Product Description

3.1 System Overview

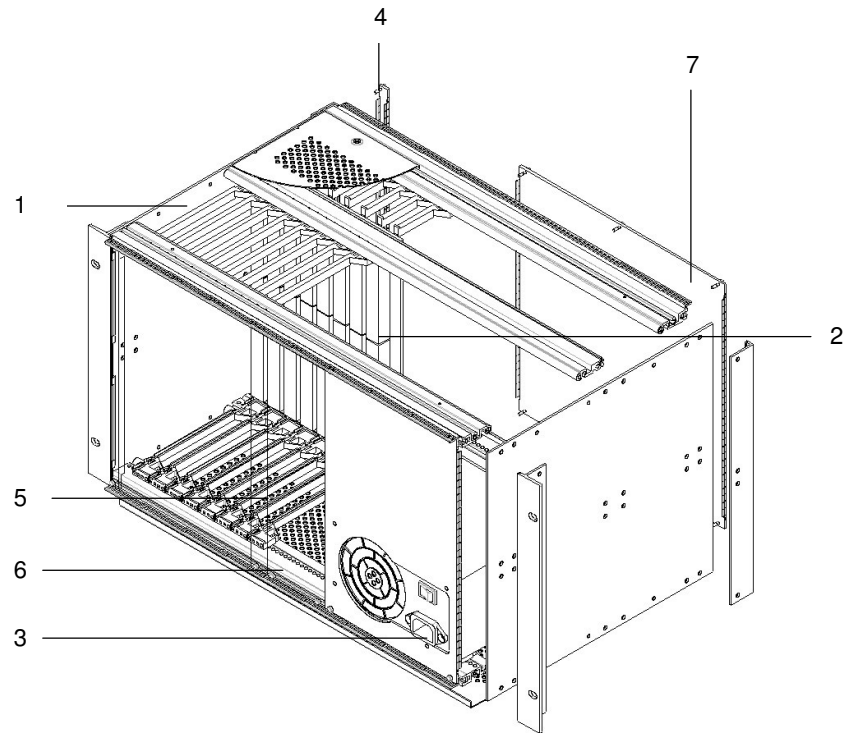
3.1.1 CPCI Basic 3 U 84 HP



1	CompactPCI card rack, 3U	4	3 x Filler panel 4HP, 3U with EMC gasket
2	CPCI backplane: 3U, 8 slot, system slot right, rear I/O, ATX connector	5	1 x Filler panel 12HP, 3U with EMC gasket
3	Industrial PS2 power supply 300 W, 3U 32HP	6	1 x Filler panel 48HP, 3U with EMC gasket

Figure 3-1: CPCI Basic 3 U 84 HP

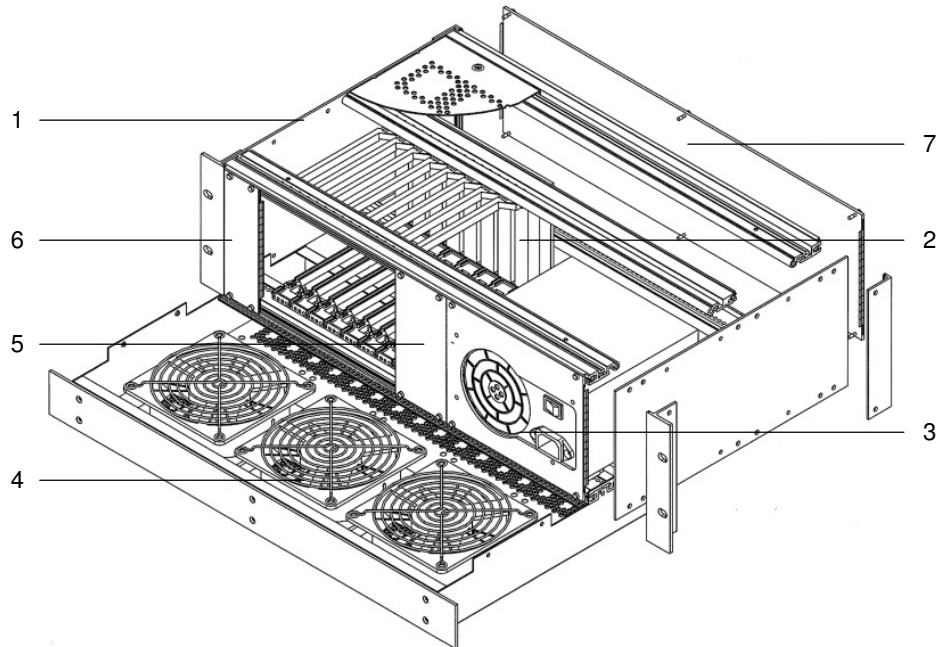
3.1.2 CPCI Basic 6 U 84 HP



1	CompactPCI card rack, 6U	4	2 x Filler panel 2HP, 6U with EMC gasket
2	CPCI backplane: 3U, 8 slot, system slot right, rear I/O, ATX connector	5	1 x Filler panel 4HP, 6U with EMC gasket
3	Industrial PS2 power supply 300 W, 3U 32HP	6	1 x Filler panel 14HP, 6U with EMC gasket
		7	1 x Filler panel 50HP, 6U with EMC gasket

Figure 3-2: CPCI Basic 6 U 84 HP

3.1.3 VPX Basic 4 U 84 HP



1	VME64x card rack, 4U	4	3 x DC fans: 119 x 119 x 32 mm, with finger guards
2	VPX backplane: 3U, 8 slot, (3 x VME64x, 5 x VPX), ATX connector	5	1 x Filler panel 12HP, 3U with EMC gasket
3	Industrial PS2 power supply 300 W, 3U 32HP	6	1 x Filler panel 8HP, 3U with EMC gasket
		7	1 x Filler panel 84HP, 3U with EMC gasket

Figure 3-3: VPXI Basic 4 U 84 HP with 3 DC fans

3.2 Subracks

The CompactPCI and VPX subrack cover and bottom plate (perforated), made of chromated aluminum, with IEEE guide rails and ESD clip mounted at the bottom

3.3 Backplanes

3.3.1 CPCI Backplane

General and technical Information

The CompactPCI bus is compatible with the PCI bus known from the PC world as far as the electrical specifications are concerned.

The mechanical specifications were adapted to the commonly used Euro-board plug-in system in the 19" card rack. Therefore this bus is also suitable for industrial purposes. Previously unattained signal speeds supported by the layout technology developed by Hartmann Elektronik guarantee more stability and reliability for assemblies operating in the limit range.

The backplanes manufactured by Hartmann Elektronik are distinguished by a completely novel energy buffering feature which works across the entire frequency range.

This feature guarantees improved reliability thanks to more stable supply voltages directly at the slot in conjunction with fluctuating loads.

Chassis GND connection

A continuous electrically conductive chassis GND surface is located in the area where the bus board is mounted on the card rack. An M3 screw connection is available to connect the chassis ground. By installing a connecting bracket or terminal bar, the chassis GND can be connected to GND in a low-resistance star arrangement.

JTAG connector

A separate 6-pin connector for JTAG boundary scan is implemented on the backplane.

Faster, simpler system initialization and testing by means of the JTAG bus even in the completely mounted state are achieved by direct access via an additional connector on the backplane.

IPMB connector

A separate 5-pin connector for IPMB extension is implemented on the backplane.

Utility connector

The special signals to the power supply unit and external LEDs are routed to separate plug-in connectors on the backplanes. Depending on the backplane type, either a 10-pin or a 14-pin connector is used.

ATX connector

The ATX power supply connector used in the PC world is integrated in some backplane variants.

This results in a highly efficient and economic solution for supplying power to the backplane via ATX connectors and for the wiring of fans and drives.

3.3.2 Backplane CPCI 3U 8 Slot

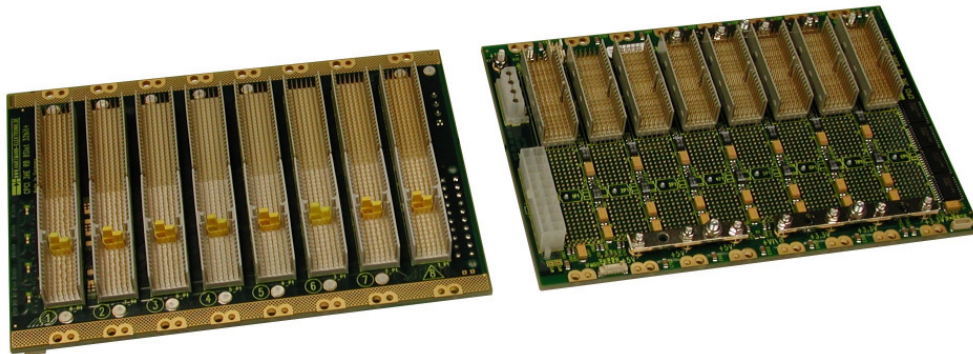


Figure 3-4: Backplane CPCI 3U 8 Slot front / rear

3.3.3 Backplane CPCI 6U 8 Slot

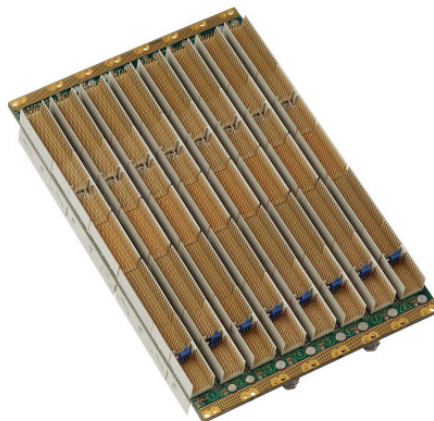


Figure 3-5: Backplane: CPCI 6U 8 slot (front)

3.3.4 VPX Backplane

General and technical Information

The VPXbus, based on ANSI/VITA 46.0 standard, is a new industrial standard for fast serial connections. The transmission rate is approximately 2.5 Gbps per lane (X1-Link). For this Hybrid-Backplane an additional VMEbus Signal Mapping on VPX according ANSI/VITA 46.1 is implemented. The connection to the approved VMEbus is done via VME64x-J1 slots.

ALL Hartmann VMEbus boards are based on the HIGH-SPEED DESIGN concept.

Low reflection is achieved by means of uniform signal line surge impedance.

Shielding of each individual signal line assures minimal coupling and therefore guarantees trouble-free operation.

Termination

In order to prevent interference on signal lines which might result from reflection at open line ends, these lines must be terminated on the VMEbus.

A distinction is made between passive and active termination. The advantage of active termination is reduced closed-circuit current consumption.

Passive termination features better frequency response.

Automatic daisy chaining

For this VPX-Backplane daisy chaining is implemented using a integrated OR logic. This logic closes the daisy chain when the daughter board is removed.

Chassis GND connection

There is a solid electrically conductive chassis GND surface in the backplane-to-card rack mounting area. This guarantees EMC-tight mounting of the bus board on the card rack.

HF coupling of card rack and system ground is implemented for VPX by capacitors (10nF, 200 V in each slot). Static charges are discharged with a resistor ($\geq 1 \text{ M}\Omega$). An additional Chassis-GND connection is provided with a M4 terminal screw.

Power connections

The main operating voltages and GND are supplied with M4 screw terminals. The auxiliary operating voltages are supplied via M3 screw terminals. Optimal daughter board supply and trouble-free operation are ensured by the arrangement of the feed modules on the backplane.

Standard VPX Slot Keying for 3U Backplanes

The standard orientation of coding keys is anytime changeable by the customer. For backplanes made by Hartmann Elektronik every key for every slot is settable to all 5 possible positions.

Utility connector

There are 2 connectors for system- management IPMB and SMB. IPMB_PWR and SMB_PWR are connectable to power with 3-pin feed-through connectors (X2/X4).

For customer specific board assembly are Zero-Ohm resistors available.

Usable voltages for IPMB are 5V / 3.3V-AUX and for SMB 5V / +5VSTBY.

3.3.5 Backplane VPX 3U 8 slot ()

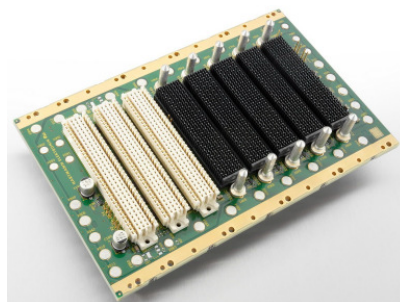


Figure 3-6: Backplane VPX 3U 8 slot (3 x VME64x, 5 x VPX) front

3.4 Electrical Connection and Power Supply

3.4.1 Grounding/Protective Earthing

The system contains gaskets at the subrack and board level to guard against electromagnetic interference (EMI). Each of the subrack's individual components make contact with the gaskets and to the PE-stud inside the rear panel.

The guide rails are also fitted with electrostatic discharge (ESD) contacts for each blade and RTM. These ESD contacts ensure that the boards are fully discharged to prevent static caused by static as they are plugged into the subrack.



Caution!

The subrack is designed in accordance with protection class 1!! It must therefore be operated with protective earth/GND connection. Use only a three conductor AC power cable with a protective earth conductor that meets the IEC safety standards!



Figure 3-7: Power Connection

3.4.2 Power Supply

The 300 W PC power supply is distinguished by very high reliability and long service life. By its integrated 4 kV surge input filter the power supply is also suitable for highly demanding industrial applications. Within an ambient temperature range of -10 up to +50 °C full power can be supplied continuously without restrictions. The temperature regulated ball-bearing fan provides a tachometer signal and can continuously be monitored by the board, which is very important with regard to system reliability.

The power supply has the following main features:

- Designed for continuous operation 24/7
- 105 °C electrolytic capacitor
- Temperature regulated tachometer fan
- 5 years delivery guarantee
- Approved -10 up to 50 °C
- +3.3V and +5V sensed
- 4KV Surge Input filter

Technical data

Input voltage	90...264VAC, 120...380VDC / active PFC
Input frequency	47...63Hz
Input current	7A (115V) / 3.5A(230V)
Inrush current	44/87A (115/264VAC, +25 °C)
Efficiency	≥75%, 230VAC / ≥70%, 115VAC (at full load)
Overload protection	110...150%, shut down
Short circuit protection	at each output, shut down / +5VSB, auto recovery
Over voltage protection	+3.3V(+3.9...+4.3V), +5V(+5.7...+6.5V), +12V(+13.6...+15V)
Ripple & Noise	+3.3V 50mV/ +5V 50mV/ +12V 120mV/ -12V 150mV/ -5V 150mV/ +5VSB 50mV
Voltage regulation	+3.3V ±5% / +5V ±5% / +12V +7% -5% / -12V ±5% / -5V ±5% / +5VSB ±5%
Hold up time	>16msec.
Power Good Signal	switch on delay 100...500msec. switch off delay 1msec.
Isolation voltage	Input/Chassis 3100 VDC for 60sec. Input/Output 4242 VDC for 60sec.
Leakage current	< 3,5mA, 115VAC / 230VAC
Operating temperature	-10...+50 °C
Operating humidity	10...80% RH, non-condensing
MTBF	100.000h at +50 °C, without fan
Safety	TUV EN 60950 / UL 60950
EMC	CE
Dimensions (L x W x H)	150 x 140 x 86mm, ±0,5mm
Fan	ball bearing fan, temperature controlled with tachometer signal and cool down function up to a few minutes after shutdown PC into stand by mode.

Output Current

+3,3V		+5V		+12V		-12V		-5V		5V SB	
Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
0A	28,0A	0,5A	35,0A	1A	22,0A	0A	1A	0A	0,8	0A	2,0

Maximum continuous total DC output power should not exceed 300 W. The output current at +3,3V and +5V together must not exceed 45A.

This power supply is for assembly purposes only. It must not operate in unassembled condition.

The final assembly has to comply to the valid EMC standards.



Figure 3-8: ATX Power Supply 300W, 3U 32HP

For DC Power Supply, please ask Hartmann Elektronik.

3.5 Cooling

The operating temperature is from 0°C to 40°C.

3.5.1 CPCI Basic 3U and 6U

The CPCI front and rear I/O boards are cooled by heat dissipation through convection (from bottom to top). The operating temperature is from 0°C to 40°C.

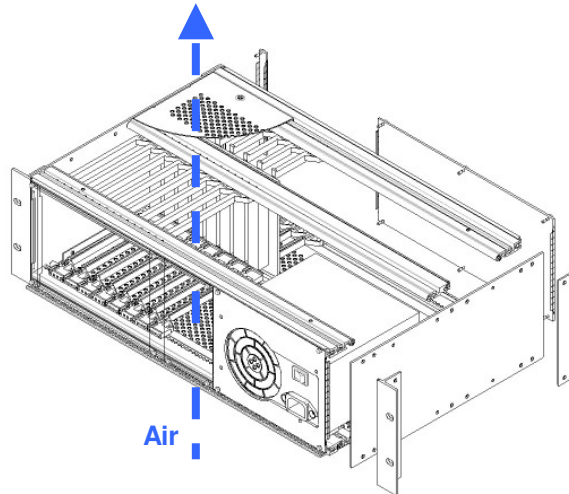


Figure 3-9: Air Flow (convection)

3.5.2 VPX Basic 4U

The front boards are cooled by forced air convection through three DC axial fans 119 x 119 x 32 mm. The rear I/O boards are cooled by heat dissipation through convection, optional through five additional DC axial fans 80 x 80mm.

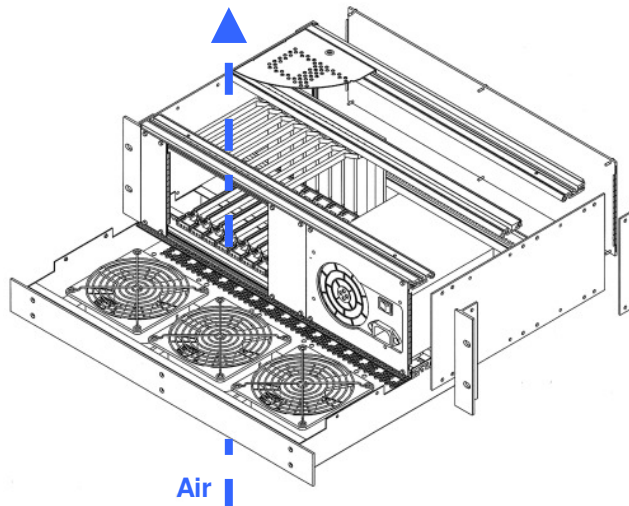


Figure 3-10: Air Flow (fan tray)



Caution!

To ensure proper air flow within the system make sure that all slots are populated with either boards or filler panels.

4 Installation

This section provides set up information and operation for the subrack:

- Subrack Components
- Inspecting the Components
- Protection Against Electromagnetic Interference
- Preparing the Subrack

4.1 Subrack Components

The subracks comes equipped with the following components:

- CPCI card rack, 3U, and 6U 84HP, 280mm deep
- VPX card rack, 4U, 84HP, 280mm deep
- 8-slot front and 8 RTM slots
- One fan tray with alarm indicator (only order number: LMH0000410)
- One PS2 power supply 300W AC
- One CPCI backplane compliant with PICMG 2.0 R3.0 specification.
- One VPX backplane compliant with VITA 46.0 baseline specification, VITA 46.1 VME, VITA 46.4 PCI Express

4.2 Inspecting the Subrack Components

During the course of handling, shipping, and assembly, pins, shrouds, mounting screws, fans and other items can become damaged and/or loose.



WARNING: Before utilizing the subrack, perform a thorough inspection to ensure the subrack and its components are not damaged.

- To inspect the subrack:
 1. Visually inspect the subrack to ensure that all of the connector pins are straight, screws are tight, and so on.
 2. Check to ensure none of the EMI gaskets are damaged.

4.3 Protection Against Electromagnetic Interference

The subrack contains gaskets at the shelf and board level to guard against electromagnetic interference (EMI). Ensure that the subrack is grounded and that each of the subrack individual components make contact with the gaskets.

Follow the proper grounding and ESD handling procedures.

4.4 Preparing the Subrack

Side flanges are provided to allow the shelf unit to be mounted in a 19" (482.6 mm) cabinet. In preparing the subrack perform the following:

- Mounting the Subrack
- Powering the Subrack
- Installing Boards
- Installing Filler Panels

4.4.1 Mounting the Subrack

This subrack system can be installed in 19" equipment racks or cabinets

- Ensure that the rack or cabinet is constructed to support the weight and dimensions of the system.
- Incorrect system installation can cause the rack or cabinet to topple over, additional stabilization might therefore be required.
- Single system installations should be mounted at the bottom of the rack or cabinet. In multi system installations the bulk of the weight should be concentrated in the lower part of the rack or cabinet.

4.4.2 Powering the Subrack

Before inserting boards, power the shelf to ensure that it is operating properly. The power connections and the mains switch are located at the front of the shelf

- Ensure that the AC switch is set to the off (O) position.
- Connect the mains AC cable (C14, 10 Amp, not supplied) to the AC inlet.
- Turn the AC switch to the on (I) position.



Figure 4-1: AC Input (sample: CPCI Basic 3U version)

4.4.3 Installing Boards

The shelf is compliant with:

- CPCI Standard PICMG 2.0 R3.0
- VITA 46.0 baseline specification, VITA 46.1 VME, VITA 46.4 PCI Express

and accepts boards that are compliant with the:

- CPCI Standard PICMG 2.0 R3.0. and
- VITA 46.0 baseline specification, VITA 46.1 VME, VITA 46.4 PCI Express



WARNING: Boards should slide easily when installing or removing them from the shelf. Forcing the boards may cause damage to the interface connector pins.

4.4.4 Installing Filler Panels

Filler panels consists of a front panel (with or w/o air baffles), EMC gasket and mounting screws.

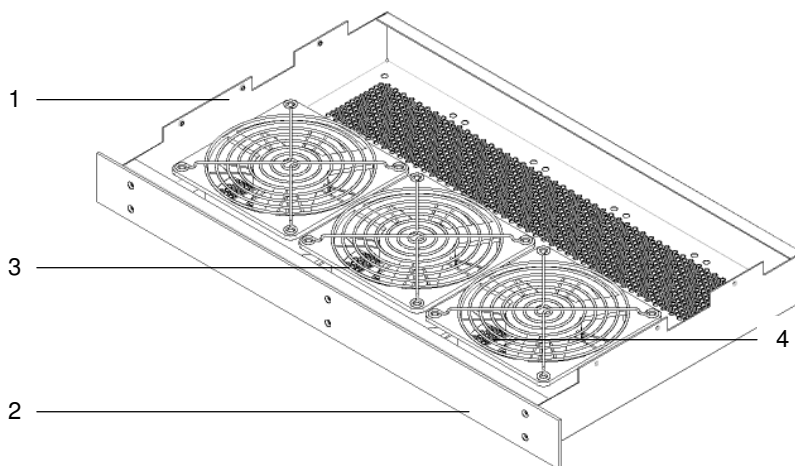


WARNING: Close all empty subrack slots with filler panels. The filler panel prevents fan air from escaping out open slots.

5 Fan Tray Basic 1 U 84 HP

5.1 General Specification

- 1 U / 84 HP ventilation unit made of chromated aluminum
- With 3 fans 119 x 119 x 38 mm, incl. finger guards
- Prepared for installation of up to 5 fans (80 x 80 mm) in the rear I/O area
- For mounting on Hartmann standard card racks (dismounting of bottom plate)
- Air flow from bottom to top



1	1 U Fan unit	4	3 x DC fans: 119 x 138 x 25 mm,
2	Front panel, aluminum 2,5mm	5	Finger guard

Figure 5-1: CPCI Basic 2 U 84 HP with hot-swap fan tray

5.2 Fan Tray Standard

5.2.1 Fans

General Specification

- Motor Protection: Auto Restart/Polarity Protection
- Isolation Resistance: 10M Ω or over with a DC500V Megger
- Dielectric Withstand Voltage: 700VAC 1s
- Ambient Temperature Range: -10°C - +70°C (Operating)

Technical data DC fan 119 x 119 x 38 mm

Dimensions:	119mm x 119mm, 38mm thick
Rated Voltage:	12V
Operating Voltage	6,0 – 13,8V
Rated Current	0,55A
Rated Input:	6,6W
Rated Speed:	2950min ⁻¹
Air Flow:	108 cfm (3,7 m ³ /min)
Static Pressure:	68,2Pa (0,27 inchH ₂ O)
Noise:	42,5dB(A)
Bearing	Ball Bearing
Operating Temperature	-10°C - +70°C

Storage Temperature	-40°C to +70°C
Life Expectancy	50.000h (25 °C)
Material	Casing: Plastic (black) 94V-0 Impeller: Plastic (black) 94V-0 Lead Wire: UL1007, AWG24, +red, -black

5.3 Fan Tray with system monitoring

5.3.1 System monitoring and fan control HE2661HW

Description

HE2661 is a module for direct control of fans and attainments for the monitoring of supply voltages. The module supports the monitoring of up to 4 voltages (+3.3 V, +5 V, +12 V and -12V). For each of these voltages can be defined a minimum and maximum value.

The fan controller is designed for 12V fan with tacho signal. It supports up to 8 fans. These are divided into 4 groups of 2 fans. Each group can be assigned to one of 4 temperature sensors. The maximum current is 1.5 amps per fan. The total power consumption is maximum at 13 A. The supply voltage is 12V.

The setting of the parameters required for fan, temperature sensors and voltage monitoring takes place with the program fan control executed via a USB interface. Fan control is an executable Windows program. The description of all settings and system requirements can be found in the manual.

5.3.2 Fans

General Specification

- Highly stable characteristic curve for high air flow with high back pressure.
- Low operating noise at high back pressure.
- Material: aluminium housing, fiberglass-reinforced PA impeller
- Fully integrated electronic commutation.
- Protected against reverse polarity and blocking.
- Air intake over struts. Rotational direction CCW looking at rotor.

Tacho Signal

- 2 pulses per revolution
- TTL-compatible.
- Integrated pull-up resistor.
- The sensor signal also serves as a major comparison variable for setting and maintaining.
- Desired speed for interactive or controlled cooling with one or more interconnected fans.

Technical data DC fan 119 x 119 x 38 mm

Dimensions:	119mm x 119mm, 38mm thick
Rated Voltage:	12V
Operating Voltage	7,0 – 15
Rated Input:	4,5W
Rated Speed:	3200min ⁻¹
Air Flow:	180m ³ /h
Static Pressure:	68,2Pa (0,27 inchH ₂ O)
Noise:	49dB(A), 5,7 Bel
Bearing	Ball Bearing
Operating Temperature	-30 °C - +70 °C
Life Expectancy	85.000h (L10Δ (40 °C)

5.3.3 Controls and Indicators

There are the following controls and indicators located on the fan tray front panel:

- Display for fan speed, voltages and temperatures.
- green/red LED. Fan
- green/red LED. Temp
- green/red LED. +3,3V
- green/red LED. +5V
- green/red LED. +12V
- green/red LED. -12V
- On/Off switch
-



Figure 5-2: Fan Tray Front Panel

6 Service

6.1 Technical support and Return for Service Assistance

Please return the complete subrack system. For all product returns and support issues, please contact your Hartmann sales distributor or www.hartmann-elektronik.de

Please use the original packing material. Shipping without the original packing material might void the warranty.

6.2 Declaration of Conformity

The HARTMANN CPCI system platform Basic subracks are developed and manufactured according to EN 60950-1.

The HARTMANN CPCI system platform Basic subracks are not end-products with independent functionality according the EMC regulations, therefore CE marking is not required. Not before CPCI boards are plugged into the subrack, the systems fulfill the requirements in accordance with EMC Directive 2004/108/EG and Low-voltage Directive 2006/95/EG.

With the EMC optimized enclosure design and the high quality power input filters for the mains connection offers HARTMANN CPCI systems serve an ideal base for system Integrators, which comply with the limits of EN 6100-6-3 and EN 61000-6-2

A functionality test and protective earth test is carried out on each system.

The included power supplies are in accordance with EN 60950-1, EN 55022 / FCC Class A IEC 61000-3-2 HARMONIC.

6.3 Scope of Delivery

Subrack	Quantity	Description
CPCI Basic 3U	1	CPCI card rack, made of chromated aluminum, cover and bottom plate perforated, with IEEE guide rails and ESD clip mounted at the bottom
	1	CPCI backplane: 3U, 8 slots, ADC (Automatic Daisy Chain), active termination, with ATX-Connector
	1	Partial front panel 4HP, 12HP and 48HP / 3U with EMC gaskets
CPCI Basic 6U	1	CPCI card rack, made of chromated aluminum, cover and bottom plate perforated, with IEEE guide rails and ESD clip mounted at the bottom
	1	CPCI backplane: 6U, 8 slots, ADC (Automatic Daisy Chain), active termination, with ATX-Connector
	2	Partial front panel 2HP, 6U with EMC gasket
	1	Partial front panel 4HP, 14HP or 50HP / 6U with EMC gaskets
VPX Basic 4U	1	VPX card rack, made of chromated aluminum, cover and bottom plate perforated, with IEEE guide rails and ESD clip mounted at the bottom
	1	VPX backplane: 4U, 8 slots (3 x VME64x + 5 x VPX), Automatic Daisy Chain, active or passive termination, with ATX-Connector
	1	Partial front panel 8HP, 12HP or 84HP / 3U with EMC gaskets
CPCI Basic 3U/6U VPX Basic 4U	1	Industrial power supply PS2 300 W with wide range input 90 – 264 VAC (3.3 V / 28 A, 5 V / 35 A, 12 V / 22 A, –12 V / 1 A, –5V / 0,8A, +5VSB/2A) with PFC, with ATX connector
Fan Tray 1U	1	Chassis, made of chromated aluminum.
	3	DC fans: 119 x 119 x 38 mm (Fan Tray 1U 84HP, No.:LMH0000230)
	1	System monitoring and fan control (Order No.: C161.60410)
	1	DC cabling

6.4 Subrack Specifications

Dimensions	CPCI Basic 3U	
	Height	132,5mm
	Width	444,6mm
	Depth (front card cage)	for Boards: 160mm
	Depth (subrack)	280mm
	CPCI Basic 6U	
	Height	265,85mm
	VPX Basic 4U	
	Height	177mm
	Fan Tray 1U	
	Height	44,45mm
Weight	CPCI Basic 3U	5,5kg
	CPCI Basic 6U	6,6kg
	VPC Basic 4U	7,2kg
	Fan Tray 1U	1,7kg
AC Power Supply	Input	90 – 264 VAC
	Frequency	47 – 63 Hz
	Output Power	300 W
DC Power Supply	optional	
Cooling	VPX Basic 4U	3 x DC fans: 119 x 119 x 38 mm, 180m³/h, 49 dB(A)
Temperature:	Operating	0 °C to +40 °C
	Storage	-30 °C to +70 °C
	Transport	-30 °C to +70 °C
Humidity:	Operating	5% to 80% non-condensing
	Storage	5% to 80% non-condensing
	Transport	5% to 80% non condensing
Shock		MIL-STD-810F 1 Jan 2000 Annex C, U.S highway truck Figure 514.5C-1, vertical Shock test (Sawtooth) Figure 516.5-10
Vibration:		DIN EN 61373:1999, Figure 2, Category 1, Class B MIL-STD-810F 1 Jan 2000 Annex C, Shipboard: Figure 514.5C-15
EMC	Emissions	EN 61000-6-3
	Immunity	EN 61000-6-1
Safety		Test voltages according to EN 60950-1
Electromagnetic Shielding		Typ.40 dB at 1 GHz (with front panels)
Regulatory Compliance:		EN60950-1